

WHAT IS CLAIMED IS:

1 1. In an Internet Protocol (IP)-based network
2 utilizing Session Initiation Protocol (SIP) for call
3 setup, a method of address resolution comprising the
4 steps of:

5 receiving in a Resolver in the IP-based network, a
6 call setup message from a requesting application, said
7 call setup message including a destination address in a
8 format other than an IP address;

9 sending a DNS Query from the Resolver to a Domain
10 Name Server (DNS), said DNS Query requesting an IP
11 address associated with the destination address;

12 sending an answer from the DNS to the Resolver, said
13 answer including an IP address of a destination server
14 and an indication of an Application protocol supported by
15 the destination server;

16 determining in the Resolver whether the Application
17 protocol is SIP; and

18 upon determining that the Application protocol is
19 SIP, sending the IP address of the destination server
20 from the Resolver to the requesting application.

1 2. The method of address resolution of claim 1
2 further comprising, upon determining that the Application
3 protocol is not SIP, the steps of:

4 sending an LS Query from the Resolver to a Location
5 Server (LS), said LS Query including a domain name as the
6 destination address and requesting an IP address of a
7 gateway function capable of converting SIP to the
8 Application protocol;

9 sending the IP address of the gateway function from
10 the LS to the Resolver; and

11 sending the IP address of the gateway function from
12 the Resolver to the requesting application.

1 3. The method of address resolution of claim 1
2 further comprising, after the step of sending a DNS Query
3 from the Resolver to the DNS, the steps of:

4 determining in the DNS that the DNS cannot resolve
5 the address;

6 sending an answer from the DNS to the Resolver that
7 includes an address for a subsequent DNS; and

8 sending a second DNS Query from the Resolver to the
9 subsequent DNS.

1 4. The method of address resolution of claim 1
2 further comprising, after the step of sending a DNS Query
3 from the Resolver to the DNS, the steps of:

4 determining in the DNS that the DNS cannot resolve
5 the address; and

6 sending a second DNS Query from the DNS to a
7 subsequent DNS.

1 5. The method of address resolution of claim 1
2 wherein the destination address is in the format of a
3 Uniform Resource Locator/Uniform Resource Identifier
4 (URL/URI), and the method further comprises extracting by
5 the Resolver, a domain name from the URL/URI and
6 including the domain name in the DNS Query sent from the
7 Resolver to the DNS.

1 6. The method of address resolution of claim 1
2 wherein the destination address is in the format of an
3 E.164 number (ENUM), and the method further comprises
4 converting by the Resolver, the E.164 number into a
5 domain name in ENUM format and including the ENUM-
6 formatted domain name in the DNS Query sent from the
7 Resolver to the DNS.

1 7. A unified method of address resolution in an
2 Internet Protocol (IP)-based network that includes a
3 Telephone Routing for IP Protocol (TRIP) Framework, and
4 that utilizes Session Initiation Protocol (SIP) for call
5 setup, said method comprising the steps of:

6 determining by a Resolver in the network, whether an
7 address input by a requesting application is a Uniform

8 Resource Locator/Uniform Resource Identifier (URL/URI) or
9 an E.164 number;
10 upon determining that the input address is a
11 URL/URI, extracting by the Resolver, a domain name from
12 the URL/URI;
13 upon determining that the input address is an E.164
14 number, converting by the Resolver, the E.164 number into
15 the domain name in ENUM format;
16 determining whether a Domain Name Server (DNS) is
17 able to translate the domain name into an IP address for
18 a destination server;
19 upon determining that the DNS is unable to translate
20 the domain name:
21 using by the Resolver, a Location Server (LS)
22 to obtain an IP address of a gateway function capable of
23 interfacing with the destination server; and
24 returning the IP address of the gateway
25 function from the Resolver to the requesting application;
26 upon determining that the DNS is able to translate
27 the domain name:
28 sending from the DNS to the Resolver, an IP
29 address of the destination server and an indication of an
30 Application protocol supported by the destination server;
31 determining by the Resolver whether the
32 Application protocol is SIP;

33 upon determining that the Application protocol
34 is SIP, returning the IP address of the destination
35 server from the Resolver to the requesting application;
36 and

37 upon determining that the Application protocol
38 is not SIP:

39 using by the Resolver, an LS to obtain an
40 IP address of a gateway function capable of interfacing
41 with the destination server; and

42 returning the IP address of the gateway
43 function from the Resolver to the requesting application.

1 8. The unified method of address resolution of
2 claim 7 further comprising, after the step of sending
3 from the DNS to the Resolver, the IP address of the
4 destination server and the indication of the Application
5 protocol supported by the destination server, the steps
6 of:

7 determining by the Resolver whether the Application
8 protocol supported by the destination server matches a
9 protocol supported by the requesting application;

10 sending the IP address of the destination server to
11 the requesting application, upon determining that the
12 Application protocol supported by the destination server
13 matches the protocol supported by the requesting
14 application; and

15 requesting the IP address of the gateway function
16 capable of interfacing with the destination server from
17 the Local LS, upon determining that the Application
18 protocol supported by the destination server does not
19 match the protocol supported by the requesting
20 application.

1 9. The unified method of address resolution of
2 claim 7 wherein the step of using by the Resolver, an LS
3 to obtain an IP address of a gateway function capable of
4 interfacing with the destination server includes sending
5 the domain name to an extended LS that is modified to
6 receive a domain name and return an IP address of a
7 gateway function.

1 10. The unified method of address resolution of
2 claim 7 wherein the step of determining whether the DNS
3 is able to translate the domain name into the IP address
4 for the destination server includes determining by the
5 DNS whether operator-specified information in the DNS
6 indicates that the domain name is one for which an
7 interrogation of an LS is required.

1 11. The unified method of address resolution of
2 claim 10 further comprising, upon determining by the DNS
3 that operator-specified information in the DNS indicates
4 that the domain name is one for which an interrogation of
5 the LS is required, the step of indicating in a response
6 to the Resolver that an address of an LS is being
7 returned so that the Resolver can query the LS utilizing
8 a protocol appropriate for an LS.

1 12. A system for address resolution in an Internet
2 Protocol (IP)-based network that utilizes Session
3 Initiation Protocol (SIP) for call setup, said system
4 comprising:

5 a Resolver that determines whether an address input
6 by a requesting application is a Uniform Resource
7 Locator/Uniform Resource Identifier (URL/URI) or an E.164
8 number, and queries other nodes in the network to
9 determine an IP address for a destination server, said
10 Resolver including:

11 an extraction mechanism that extracts a domain
12 name from an input URL/URI;

13 a conversion mechanism that converts an input
14 E.164 number to a domain name in ENUM format; and

15 a signaling logic mechanism that sends a domain
16 name query to other nodes in the network and requests an
17 IP address for the destination server;

18 at least one Domain Name Server (DNS) that receives
19 the domain name query from the Resolver and, if able to
20 translate the domain name, returns to the Resolver, the
21 IP address for the destination server, and if unable to
22 translate the domain name, returns to the Resolver an
23 address of a Location Server (LS); and

24 an extended Location Server (LS) that receives the
25 domain name query from the Resolver and returns to the
26 Resolver, an IP address of a gateway function capable of
27 interfacing with the destination server.

1 13. The system for address resolution of claim 12
2 wherein the DNS, if able to translate the domain name,
3 also returns to the Resolver, an indication of an
4 Application protocol supported by the destination server,
5 and the Resolver includes a protocol analyzer that
6 analyzes the Application protocol to determine whether
7 the Application protocol is SIP.

1 14. The system for address resolution of claim 13
2 wherein the signaling logic mechanism sends the IP
3 address of the destination server to the requesting
4 application upon receiving an indication from the
5 protocol analyzer that the Application protocol is SIP.

1 15. The system for address resolution of claim 14
2 wherein the signaling logic mechanism sends the domain
3 name query to the extended LS upon receiving an
4 indication from the protocol analyzer that the
5 Application protocol is not SIP.

1 16. The system for address resolution of claim 13
2 wherein the DNS, if unable to translate the domain name,
3 also returns to the Resolver, an indication that an
4 address of an LS is being returned so that the Resolver
5 can query the LS utilizing a protocol appropriate for an
6 LS.

1 17. The system for address resolution of claim 13
2 wherein the DNS is able to translate the domain name to
3 an address of a global gateway function, and the DNS
4 returns to the Resolver, the address of the global
5 gateway function and an indication that an address of a
6 gateway function is being returned so that the Resolver
7 can distinguish the returned address from an address of
8 another DNS.

1 18. A Domain Name Server (DNS) for use in a system
2 for translating domain names into Internet Protocol (IP)
3 addresses, said system also including a Resolver
4 associated with a Serving Call State Control Function (S-
5 CSCF) that sends domain name queries to the DNS
6 requesting translation, and an Extended Location Server
7 (LS) that receives domain name queries from the Resolver
8 and returns IP addresses of gateway functions to the
9 Resolver, said DNS comprising:

10 an address translation table; and
11 address translation logic that determines whether
12 the domain name received from the Resolver can be
13 translated using the address translation table,
14 determines an appropriate response from a plurality of
15 possible responses to the Resolver, and sends the
16 appropriate response to the Resolver, said possible
17 responses including:

18 an IP address of another DNS, upon determining
19 that the domain name received from the Resolver cannot be
20 translated;

21 an IP address of the Extended LS along with an
22 indication that the returned address is for an LS, upon
23 determining that the domain name received from the
24 Resolver cannot be translated;

25 an IP address of a destination server along
26 with an Application protocol supported by the destination
27 server, upon determining that the domain name received
28 from the Resolver can be translated; and

29 an IP address of a global gateway function
30 along with an indication that the returned address is for
31 a gateway function, upon determining that the domain name
32 received from the Resolver can be translated.